

In the claims:

1. A method for inspecting a cylinder component of high-pressure cylinders of steam turbines, wherein the cylinder component has an axial dimension, comprising the steps of:
  - supporting a linear phased array of ultrasonic transducers at an axial location along the surface of the cylinder component;
  - moving the linear phased array of ultrasonic transducers axially while monitoring the linear phased array of ultrasonic transducers output to identify an axial location to be monitored;
  - fixing the linear phased array of ultrasonic transducers at the axial location to be monitored;
  - moving the linear phased array of ultrasonic transducers circumferentially around the surface of the cylinder component at least 360° while noting outputs of the linear phased array of ultrasonic transducers indicative of fatigue induced flaws in a wall of the cylinder component;
  - routing the linear phased array of ultrasonic transducers circumferentially around the fixed axial location where the most significant flaw was noted from the linear phased array of ultrasonic transducers outputs during the previous moving step; and
  - successively focusing the linear phased array of ultrasonic transducers at different depths in the wall where the most significant flaw was noted to further characterize the depth and size of the flaw.
2. The method of Claim 1, wherein the linear phased array of ultrasonic transducers are supported on the inside surface of the cylinder component.
3. The method of Claim 1, wherein the linear phased array of ultrasonic transducers are supported on the outside surface of the cylinder component.
4. The method of Claim 1 including the step of remotely positioning the linear phased array of ultrasonic transducers on the surface of the cylinder component.

5. The method of Claim 1 including the step of remotely recording the circumferential position of the linear phased array of ultrasonic transducers on the surface of the cylinder component.
6. The method of Claim 5 including the step of coordinating the recorded circumferential position to corresponding outputs of the linear phased array of ultrasonic transducers.
7. The method of Claim 1, wherein a significant indication of a potential flaw is detected including the step of performing a magnetic rubber nondestructive examination on the surface of the steam inlet nozzle over an area where the significant indication of a potential flaw is detected.
8. The method of Claim 1 wherein the cylinder component is a main steam inlet nozzle sleeve on high-pressure outer cylinder of the steam turbine.
9. The method of Claim 8 wherein the axial location to be monitored is the trepan region of the main steam inlet nozzle.
10. The method of Claim 1 wherein the axial location to be monitored is the nozzle chamber to cylinder welds on a high-pressure inner cylinder of a steam turbine.
11. The method of Claim 1 including the steps of:
  - radially moving the linear phased array of ultrasonic transducers to a new radial position adjacent a radial location on the surface of the cylindrical component previously scanned;
  - fixing the linear phased array of ultrasonic transducers at the new radial position;
  - moving the linear phased array of ultrasonic transducers circumferentially around the surface of the cylinder component at least 360° while

noting outputs of the linear phased array of ultrasonic transducers indicative of fatigue induced flaws in the wall of the cylinder component at the new radial position;

routing the linear phased array of ultrasonic transducers circumferentially around the new radial position where the most significant flaw was noted from the linear phased array of ultrasonic transducers outputs during the previous moving step; and

successively focusing the linear phased array of ultrasonic transducers at different depths in the wall where the most significant flaw was noted to further characterize the depth and size of the flaw.

12. The method of Claim 1 wherein the cylinder component is a main steam inlet nozzle sleeve on a high-pressure outer cylinder of the steam turbine and the axial location to be monitored is the trepan region on the main steam inlet nozzle sleeve including the steps of:

supporting the linear phased array of ultrasonic transducers on an outside surface of the main steam inlet nozzle sleeve upstream of the trepan region; and

reflecting signals from the phased array of ultrasonic transducers off of an inside wall of the main steam inlet nozzle sleeve, to the trepan region.

13. The method of Claim 12 wherein the supporting and reflecting steps are conducted without disassembling the turbine cylinders.

14. The method of Claim 13 wherein the supporting and reflecting steps are conducted from outside the high-pressure outer cylinder.